

25. A lamp assembly operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes at which is provided an AC power line voltage; the lamp assembly comprising:

a gas discharge lamp having lamp terminals;

base means operable to be inserted into and held by the Edison-type lamp socket; the base means having base electrodes operable to make electrical contact with the socket electrodes; the base means also including a combination of:

(a) rectifier means connected with the base electrodes and operative, whenever the base means is indeed inserted into the Edison-type lamp socket, to provide a DC voltage at a set of DC output terminals;

(b) inverter means connected with the DC output terminals and operative to provide a high-frequency output current from a set of high-frequency output terminals; the high-frequency current having a fundamental period; each fundamental period consisting of a first and a second half-period; each half-period being of substantially equal duration; the inverter means including a first transistor operative periodically to conduct current in response to a first control voltage provided at a first control input; and

(c) connect means operative to provide connection between the high-frequency output terminals and the lamp terminals;

the combination being so arranged as to cause the first transistor to be operative: (i) to permit current to flow through it for no longer than a first brief span of time during each fundamental period, and (ii) to prevent current from flowing through it for a second brief span of time during each fundamental period; the duration of the second brief span of time being substantially longer than the duration of each half-period; the duration of the first brief span of time being substantially shorter than the duration of each half-period.

26. The lamp assembly of claim 25 wherein the second brief span of time is at least 10% longer than the duration of each half-period.

27. The lamp assembly of claim 25 wherein the first brief span of time is shorter than 90% of the duration of each half-period.

28. The lamp assembly of claim 25 wherein the inverter means also includes a second transistor operative periodically to conduct current in response to a second control signal provided at a second control input; and wherein the second transistor is operative: (i) to permit current to flow through it for no longer than a first brief span of time during each fundamental period, and (ii) to prevent current from flowing through it for a second brief span of time during each fundamental period; the duration of the second brief span of time being substantially longer than the duration of each half-period; the duration of the first brief span of time being substantially shorter than the duration of each half-period.

29. The lamp assembly of claim 28 wherein current flows through either of the two transistors for a total duration amounting to no more than about 90% of the duration of the complete fundamental period.

30. The lamp assembly of claim 25 wherein the high-frequency current has a substantially sinusoidal waveshape.

31. The lamp assembly of claim 25 wherein: (i) the first control voltage is provided to the first control input for a first time period during each half-period; and (ii) the duration of the first time period being shorter than 90% of the duration of each half-period.

32. The lamp assembly of claim 25 wherein the first control voltage is characterized by being a voltage having a peak-to-peak magnitude substantially larger than twice the forward voltage drop of a single semiconductor diode junction.

33. The lamp assembly of claim 25 wherein the first transistor is operative: (i) to conduct current whenever the instantaneous magnitude of the control voltage is larger than a first voltage level with respect to a reference potential; (ii) to prevent current from flowing through it whenever the instantaneous magnitude of the control voltage is lower than a second voltage level with respect to the reference potential; (iii) the difference between the first voltage level and the second voltage level is less than twice the forward voltage-drop of a single ordinary semiconductor diode junction; and (iv) the peak-to-peak magnitude of the first control voltage is substantially larger than twice the forward voltage drop of such a diode junction.

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34. A lamp assembly operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes at which is provided an AC power line voltage; the lamp assembly comprising:

a gas discharge lamp having lamp terminals; and

base means operable to be inserted into and held by the Edison-type lamp socket; the base means having base electrodes operable to make electrical contact with the socket electrodes; the base means also including a combination of:

(a) rectifier means connected with the base electrodes and operative, whenever the base means is indeed inserted into the Edison-type lamp socket, to provide a DC voltage at a set of DC output terminals;

(b) inverter means connected with the DC output terminals and operative to provide a high-frequency output current from a set of high-frequency output terminals; the high-frequency current having a fundamental period; each fundamental period consisting of a first and a second half-period; each half-period being substantially of equal duration; the inverter means including a first and a second transistor operative periodically and alternately to conduct current for a first and a second duration during the first and the second half-period in response to a first and a second control voltage provided at a first and a second control input, all respectively; the sum of the first and second durations being substantially shorter than the duration of the total fundamental period; and

(c) connect means operative to provide connection between the high-frequency output terminals and the lamp terminals.

35. The lamp assembly of claim 34 wherein the sum of the first and second durations is no larger than 90% of the total duration of the fundamental period.

36. The lamp assembly of claim 34 wherein the peak-to-peak magnitude of the first control voltage is substantially larger than twice the forward voltage drop of an ordinary single semiconductor diode junction.

37. The lamp assembly of claim 34 wherein the peak-to-peak magnitude of the first control voltage exceeds two volts.

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38. The lamp assembly of claim 34 wherein for two brief sub-periods during each complete fundamental period, neither of the transistors conducts current.

39. The lamp assembly of claim 38 wherein the total duration of the two sub-periods is equal to or larger than about one tenth of the complete duration of the fundamental period.

40. A lamp assembly adapted to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes at which is provided an ordinary AC power line voltage; the lamp assembly comprising:

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- a gas discharge lamp having two lamp terminals; and
- base means operable to be inserted into the Edison-type lamp socket; the base means having base electrodes operable to make electrical contact with the socket electrodes; the base means including frequency-converting ballast means connected in circuit between the base electrodes and the lamp terminals; the ballast means being operative to provide an AC voltage to the lamp terminals; the AC voltage having a fundamental period; the ballast means including a transistor having control input terminals operative to receive a control signal; the transistor being operative to conduct whenever the instantaneous magnitude of the control signal exceeds a certain level; the instantaneous magnitude of the control signal exceeding said certain level for only a brief period during each fundamental period; the duration of the brief period being substantially shorter than half the total duration of the fundamental period.

41. A lamp assembly operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes at which is provided an AC power line voltage; the lamp assembly comprising:

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- a gas discharge lamp having lamp terminals;
- base means operable to be inserted into and held by the Edison-type lamp socket; the base means having base electrodes operable to make electrical contact with the socket electrodes; the base means also including a combination of:

- (a) rectifier circuit connected with the base electrodes and operative, whenever the base means is indeed inserted into the Edison-type lamp socket, to provide a DC voltage at a set of DC output terminals; the set of DC output terminals being characterized by including a center-tap;

*terminal
base
center tap*

(b) inverter means connected with the DC output terminals and operative to provide a high-frequency output current from a set of high-frequency output terminals; and

(c) connect means operative to provide connection between the high-frequency output terminals and the lamp terminals.

42. The lamp assembly of claim 41 wherein the inverter mean is characterized by providing across a pair of inverter terminals an alternating voltage with a trapezoidal waveshape.

43. A lamp assembly adapted to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes at which is provided an ordinary AC power line voltage; the lamp assembly comprising:

a gas discharge lamp having two lamp terminals; and
base means operable to be inserted into the Edison-type lamp socket; the base means having base electrodes operable to make electrical contact with the socket electrodes; the base means including frequency-converting ballast means connected in circuit between the base electrodes and the lamp terminals; the ballast means being operative to provide a lamp current to the lamp terminals; the ballast means being characterized by including an inverter operative to provide a periodically alternating inverter output voltage having a fundamental period; the periodically alternating inverter output voltage having an instantaneous magnitude that (i) all during a first time period remains at a substantially constant negative voltage level, (ii) all during a second time period increases at a substantially constant rate, (iii) all during a third time period remains at a substantially constant positive voltage level, and (iv) all during a fourth time period decreases at a substantially constant rate; the total duration of the four time periods being equal to that of the fundamental period.

44. The lamp assembly of claim 43 wherein the duration of the first second time period is distinctly shorter than half the duration of the fundamental period.

45. The lamp assembly of claim 44 wherein the duration of the second period is larger than about one tenth the duration of the first period.

46. The lamp assembly of claim 43 wherein the lamp current is of substantially sinusoidal waveshape.

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